



Figure S1 Correlation map between vertical velocity at 500 hPa and (A) AQI, (B) PM_{2.5}, (C) PM₁₀ during 2017–2019. Dotted region denotes the correlation coefficient is significant above the 95% confidence level ($P < 0.05$) with two-side student *t*-test.

Table S1 Patients hospitalized for asthma exacerbation and air quality parameters in Qingdao from 2017 to 2019

Time	Asthma inpatients number	Vertical visibility (VV, km)	Relative humidity (RH, %)	Atmospheric pressure (P, mmHg)	Wind speed (U, m/s)
Jan 2017	281	11.0827765	67.31854839	771.3689516	3.459677
Feb 2017	282	13.29545068	62.20982143	769.7982143	3.8125
Mar 2017	263	12.22454685	61.53225806	766.4806452	3.33871
Apr 2017	290	11.85748413	60.02916667	760.0879167	3.4125
May 2017	252	12.30431644	67.98387097	758.8947581	3.391129
Jun 2017	258	13.35363095	75.96666667	756.2845833	3.075
Jul 2017	309	7.94297235	85.88306452	754.0895161	2.701613
Aug 2017	403	15.96259601	79.73502304	754.8777074	3.013825
Sep 2017	294	17.20412698	70.46666667	759.9754167	2.983333
Oct 2017	261	18.20063364	64.46370968	767.2419355	3.362903
Nov 2017	277	17.9315	53.73333333	768.5458333	3.845833
Dec 2017	355	14.6881106	53.97983871	771.2467742	3.701613
Jan 2018	321	14.53404378	59.26612903	770.6354839	3.967742
Feb 2018	253	18.1257568	60.05803571	769.1040179	3.397321
Mar 2018	266	11.45804531	71.97177419	765.3564516	4.120968
Apr 2018	319	15.56886905	65.2672619	761.6358929	4.175595
May 2018	268	14.32584485	76.91532258	758.2955645	3.254032
Jun 2018	282	8.771924603	83.30416667	755.035	3.166667
Jul 2018	293	10.67263825	88.93548387	754.7358871	3.068548
Aug 2018	281	18.09049539	77.91129032	754.7927419	3.467742
Sep 2018	322	21.15934524	64.68333333	760.5816667	2.6
Oct 2018	303	21.88824885	53.76612903	765.8822581	3.217742
Nov 2018	275	11.41043651	64.97083333	768.52375	2.675
Dec 2018	270	15.13534946	62.96774194	772.8725806	4.024194
Jan 2019	266	12.70364823	58.75806452	772.2153226	3.21371
Feb 2019	226	12.96732568	63.54464286	770.1915179	3.133929
Mar 2019	351	14.08884409	57.89516129	764.3120968	3.616935
Apr 2019	330	15.45246032	68.38333333	761.75125	3.229167
May 2019	337	19.20518433	61.14919355	758.866129	3.41129
Jun 2019	319	13.68948413	84.09861111	755.1566667	3.1875
Jul 2019	268	15.07721966	83.89516129	753.4447581	2.858871
Aug 2019	259	22.55570276	76.43145161	754.6967742	3.060484
Sep 2019	342	23.38284524	64.48333333	761.7604167	3.041667
Oct 2019	306	12.94083717	61.86175115	765.8237903	3.241935
Nov 2019	265	17.27859127	60.08333333	768.5508333	3.766667
Dec 2019	302	12.69084101	66.07718894	770.8350691	3.60023

VV, vertical visibility (km); RH, relative humidity at 2 m above the ground (%); P, atmospheric pressure at mean sea level (mmHg); U, wind speed (m/s) at the ground height of 10–12 m. The correlation between the number of asthma hospitalizations and the mean VV: $r=0.178$, $P=0.298$; mean RH: $r=-0.021$, $P=0.903$; mean P: $r=-0.185$, $P=0.281$; mean U: $r=-0.032$, $P=0.852$.